Southern Nuclear

**Dennis R. Madison**
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Docket Nos.: 50-348

NL-17-0005

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant – Unit 1
Licensee Event Report 2016-008-00
Manual Reactor Trip Due to Generator Voltage Swings

Ladies and Gentlemen:

This Licensee Event Report is being submitted pursuant to the requirements of the Code of Federal Regulations, 10 CFR 50.73(a)(2)(iv)(A) for a manual actuation of the Reactor Protection System and automatic start of the Auxiliary Feedwater system.

This letter contains no NRC commitments. If you have any questions regarding the submittal, please contact Ms. Julie Collier at (334) 814-4639.

Respectively submitted,

Mr. D. R. Madison
Vice President – Farley

DRM/JAC

Enclosure: Unit 1 Licensee Event Report 2016-008-00

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. M. D. Meier, Vice President – Regulatory Affairs
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U. S. Nuclear Regulatory Commission
Ms. C. Haney, Regional Administrator
Mr. S. A. Williams, NRR Project Manager - Farley
Mr. P. K. Niebaum, Senior Resident Inspector - Farley

Joseph M. Farley Nuclear Plant – Unit 1

Unit 1 Licensee Event Report 2016-008-00

Manual Reactor Trip Due to Generator Voltage Swings

NRC FORM 366 (11-2015) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

# LICENSEE EVENT REPORT (LER)

| 1. FACILITY NAME | 2. DOCKET NUMBER | | 3. PAGE |
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| Joseph M. Farley Nuclear Plant, Unit 1 | 05000 - | 348 | 1 of 3 |

**4. TITLE**

Manual Reactor Trip Due to Generator Voltage Swings

| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | | | 8. OTHER FACILITIES INVOLVED | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO. | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 11 | 27 | 2016 | 2016 | - 008 - | 00 | 1 | 23 | 2017 | FACILITY NAME | DOCKET NUMBER |

**9. OPERATING MODE**

1

**10. POWER LEVEL**

100

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)***

| | | | |
|---|---|---|---|
| ☐ 20.2201(b) | ☐ 20.2203(a)(3)(i) | ☐ 50.73(a)(2)(ii)(A) | ☐ 50.73(a)(2)(viii)(A) |
| ☐ 20.2201(d) | ☐ 20.2203(a)(3)(ii) | ☐ 50.73(a)(2)(ii)(B) | ☐ 50.73(a)(2)(viii)(B) |
| ☐ 20.2203(a)(1) | ☐ 20.2203(a)(4) | ☐ 50.73(a)(2)(iii) | ☐ 50.73(a)(2)(ix)(A) |
| ☐ 20.2203(a)(2)(i) | ☐ 50.36(c)(1)(i)(A) | ☒ 50.73(a)(2)(iv)(A) | ☐ 50.73(a)(2)(x) |
| ☐ 20.2203(a)(2)(ii) | ☐ 50.36(c)(1)(ii)(A) | ☐ 50.73(a)(2)(v)(A) | ☐ 73.71(a)(4) |
| ☐ 20.2203(a)(2)(iii) | ☐ 50.36(c)(2) | ☐ 50.73(a)(2)(v)(B) | ☐ 73.71(a)(5) |
| ☐ 20.2203(a)(2)(iv) | ☐ 50.46(a)(3)(ii) | ☐ 50.73(a)(2)(v)(C) | ☐ 73.77(a)(1) |
| ☐ 20.2203(a)(2)(v) | ☐ 50.73(a)(2)(i)(A) | ☐ 50.73(a)(2)(v)(D) | ☐ 73.77(a)(2)(i) |
| ☐ 20.2203(a)(2)(vi) | ☐ 50.73(a)(2)(i)(B) | ☐ 50.73(a)(2)(vii) | ☐ 73.77(a)(2)(ii) |
| | ☐ 50.73(a)(2)(i)(C) | ☐ OTHER Specify in Abstract below or in NRC Form 366A | |

**12. LICENSEE CONTACT FOR THIS LER**

| LICENSEE CONTACT | TELEPHONE NUMBER *(Include Area Code)* |
|---|---|
| Julie Collier, Licensing Engineer | 334-814-4639 |

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|
| E | EL | TD | C770 | Y | | | | | |

**14. SUPPLEMENTAL REPORT EXPECTED**

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

**15. EXPECTED SUBMISSION DATE**

| MONTH | DAY | YEAR |
|---|---|---|
| | | |

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*


On 11/26/16 at 2357 while Unit 1 was operating at 100 percent reactor power the main generator began to experience voltage and load swings, which were caused by a problem with the main generator. The unit was manually tripped at 0026 on 11/27/16 to protect the generator from potential damage. All control rods fully inserted and Auxiliary Feedwater (AFW) auto-started as expected. The Turbine Driven AFW (TDAFW) was secured at 0037, with Motor Driven AFW pumps continuing to provide flow to ensure adequate heat sink. The TDAFW auto-started a second time at 0041 on a valid actuation signal when Steam Generator levels decreased to the TDAFW actuation setpoint. The TDAFW system was secured a second time at 0047. This event is reportable per 10 CFR 50.73(a)(2)(iv)(A) due to actuation of the reactor protection system and an automatic actuation of the AFW system.

The swings were caused by an intermittent failure of the voltage isolation transducer. The voltage isolation transducer was replaced prior to the plant restarting. The transducer module is being sent off for failure analysis to aid in determination of the cause of this failure.

| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. LER NUMBER | | |
|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO |
| Joseph M. Farley Nuclear Plant, Unit 1 | 05000- 348 | 2016 | - 008 - | 00 |

NARRATIVE

A. PLANT AND SYSTEM IDENTIFICATION

Westinghouse - Pressurized Water Reactor

B. DESCRIPTION OF EVENT

On 11/26/16 at 2357 while operating at 100 percent reactor power it was discovered that the Unit 1 main generator [GEN] was experiencing swings in voltage, amps, megawatts, megavars, and speed. The utility's control center assured the control room that the disturbance was emanating from plant Farley. The Power System Stabilizer (PSS) [RG] for the main generator was showing indications of the swings and was in alarm. At 0026 on 11/27/16 the unit was manually tripped to protect the generator from potential damage. All control rods fully inserted.

The voltage isolation transducer [TD] takes input from the system and uses this signal as an input to the exciter voltage regulator. Review of video taken during the event showed that the gage that reads the output of this isolation transducer was reading zero during the event instead of tracking properly. This was not repeated during troubleshooting, and an intermittent failure of the component was determined to be the cause of the voltage and load swings.

A valid AFW actuation signal started the 1A and 1B Motor Driven AFW (MDAFW) [BA] system and the Turbine Driven AFW system (TDAFW) [BA] at 0026. At 0037, steam generator [SG] levels were above the TDAFW actuation setpoint and the pump was secured. AFW flow was maintained using MDAFW [BA] to ensure an adequate heat sink per plant procedures, but the SG levels decreased to the TDAFW actuation setpoint at 0041. This was a valid actuation signal and the TDAFW system started a second time. This second start was attributed to TDAFW having been secured with little margin in steam generator narrow range levels in an effort to minimize reactor coolant system [AB] cool down and prevent manual closure of main steam isolation valves [ISV]. The TDAFW system was secured a second time at 0047.

C. UNIT STATUS AT TIME OF EVENT

Mode 1, 100 percent power

D. CAUSE OF EVENT

The cause of the voltage and load swings was an intermittent failure of the voltage isolation transducer.

E. REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable as required by 10 CFR 50.73(a)(2)(iv)(A) due to a manual actuation of the reactor protection system and automatic actuation of the AFW system. The reactor was shut down at 0026 and entered Mode 3. There was no loss of safety function and no radioactive release associated with this event. All required safety systems were available and responded as expected. There were no actual consequences detrimental to the health and safety of the public and the event is considered to be of very low safety significance.

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NARRATIVE

F. CORRECTIVE ACTION

The voltage isolation transducer was replaced prior to the plant restarting. The transducer module is being sent off for failure analysis to confirm the cause of this failure.

G. ADDITIONAL INFORMATION

1) Previous Similar Events: No other similar previous events have been reported.

2) Commitment Information: This report does not create any licensing commitments